Chemistry Laboratory

Dr. David H. Clark
Director

Laboratory Services operates as a service for various divisions within the Department of Agriculture and Food. The division laboratories provide chemical, physical, and microbiological analyses. All samples analyzed in the laboratories are collected and forwarded by various field inspection personnel from the Divisions of Plant Industry, Regulatory Service, Animal Health, and Marketing and Conservation Programs.

Feed, fertilizer, meat and meat products, pesticide formulation, and dairy products are tested for specific ingredients as stated by the associated label guarantee. Some products are also examined for the presence of undesirable materials, such as filth, insects, rodent contamination, adulterants, inferior products, and pesticide residues.

The Dairy Microbiology Laboratory is responsible for testing grade A raw milk, finished dairy products, and administers an industry laboratory certification program. The laboratory is certified by FDA to perform the following tests: standard plate and coliform counts; microscopic and electric somatic cell determinations; antibiotic residues, proper pasteurization; and fat and water content. The laboratory is also certified as the FDA Central Milk Laboratory for the State of Utah, and our supervisor serves as the State Milk Laboratory Evaluation Officer (LEO) which has jurisdiction over the certified milk labs within the State. Last year there are 23 facilities with 120 analysts under the LEO's jurisdiction. The LEO is responsible for on-site evaluation and training of all certified analysts throughout the State and along with the dairy laboratory staff, and administers a yearly proficiency testing program for all industry analysts.

The Meat Laboratory analyzes meat and meat product samples obtained during inspections of plant and processing facilities that conform to Federal and State standards. Tests are made for fat, moisture, protein, sulfites, and added non-meat products to ensure label compliance of these products. Antibiotic residues and cross-contamination from other species are also monitored. We also analyze samples from Montana Department of Agriculture when requested. Samples (meat and carcass swabs) from processing facilities are also tested for the presence of Salmonella on a monthly basis.

The Pesticide Formulation Laboratory's function is testing herbicides, insecticides, rodenticides, and fungicides to ensure that the listing of active ingredients and their concentrations are in compliance with state labeling laws. The Pesticide Residue Laboratory tests for presence and subsequent levels of herbicide, insecticide, rodenticide, and fungicide residues in plants, fruits, vegetables, soil, water, and milk products. These samples are submitted when inspectors suspect there may be a misuse of the application of the pesticide. Milk samples are tested once a year to for pesticide contamination in accordance with FDA regulations.

Commercial feed (agricultural and pet) samples are tested for moisture, protein, fat, fiber, minerals, toxins, antibiotics, and vitamins in the Feed Laboratory. Seed moisture determinations are also performed for the State Seed Laboratory. The Fertilizer Laboratory tests solid and liquid fertilizer samples for nitrogen, phosphorus, potassium, and trace elements, and heavy metals. All feed and fertilizer results are compared to label guarantees to ensure compliance with state labeling laws.

Special Consumer Complaint Samples are also examined for the presence of undesirable materials such as filth, insects, rodent contamination and adulterations. The samples are checked to verify validity of complaint, and if found positive, the matter is turned over to departmental Compliance Officers for follow up action.

Ground and Surface Waters are monitored for the presence for pesticides, nitrates, and we also test for 25 elements and other water quality related parameters. This data is combined with other water data collected in the field to provide a picture on the quality of the state aquifers.

Accomplishments:

As shown in the accompanying table, number of tests declined for some products, which is due to budgetary cutbacks. Number of surveys by inspectors has been reduced with a subsequent reduction in number of samples submitted for testing. We continue to provide a monitoring program for food safety and the number of salmonella and pesticide tests increased considerably. We partner with the FDA ELEXNET system by providing salmonella test results.

The dairy laboratory completed their FDA split sample audit with no deficiencies noted. Currently, there are twenty-two (23) facilities with 133 analysts under the LEO's jurisdiction. The increase in dairy tests was due to more bottles being tested.

No pesticides have been detected in dairy producer samples collected last year and the ground water samples have shown a similar trend.

In spite of budget shortfalls, we continue to try and update equipment to ensure optimum results and compliance with legislative mandates.

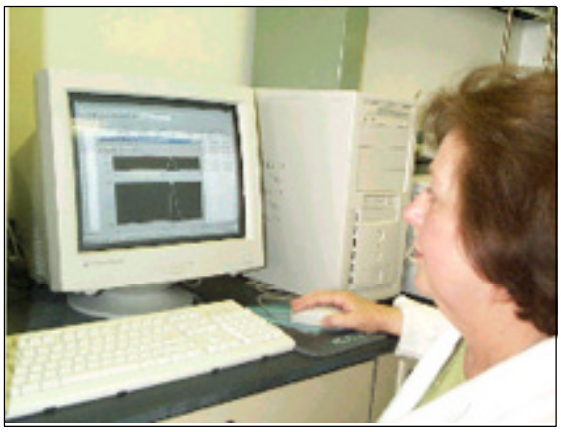
Meetings with chemists and supervisors from the different divisions continue to be held to discuss status of ongoing programs, problems that are arising, new program needs, and changes due to budget shortfalls.

The division continues to perform very well on the check sample programs administered for milk, meat, feeds, fertilizers, and pesticide residue and formulation programs.

The following is a breakdown of sample analyses performed in the various programs in the Laboratory Services Division for the years 2001, 2002 and 2003.

	2001	2002	2003
Federal Meat	84	423	255
State Meat	1,033	1,058	1,146
Montana Meat Samples	11	122	85
Dairy Microbiology	9,787	8,846	9,588
Fertilizer	714	739	645
Feed	1,335	1,491	1,407
Pesticide Formulation	23	9	11
Pesticide Residue	18	29	18
Special Samples	22	81	35
State Groundwater	31,790	31,029	23,682
Pesticide Residue in Milk	9,553	2,850	11,670
Salmonella	238	162	308
TOTAL	54,608	46,839	48,850

In addition to the above analytical work, the staff typically performs anywhere from 5000-7000 determinations on various check samples. The check sample programs are vital and essential for maintaining quality control, quality assurance, and verifying accuracy of results on routine samples. These check samples are also used to help develop new procedures.



(above) UDAF Chemististry Laboratory uses state of the art computer technology to analayze various test samples. The addition of computers improves productivity and reduces the hazards associated with working with harsh chemicals.